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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
09/761,451	01/16/2001	Joseph W. Tsang	10982033-1	8127

7590 02/26/2002

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[illegible]

SHOSHO, CALVIN J

ART UNIT	PAPER NUMBER
[illegible]	25

DATE MAILED: 02/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-15

Office Action Summary	Application No.	Applicant(s)	
	09/761,451	TSANG ET AL.	
	Examiner	Art Unit	
	Callie E. Shosho	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

In the present application, the abstract contains more than 150 words.

Claim Objections

2. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 6, which depends on claim 5, recites groups "N-vinyl carbazole, N-vinyl pyrrolidone, vinyl imidazole, vinyl pyridine, 1,4-diisocyanatobenzene,....,and 1,4-dicyclohexane diisocyanate". This claim fails to further limit the subject matter of claim 5 given that these groups do not further limit any of the groups recited in claim 5, but rather, given that these recited groups are different than those in claim 5, broaden the scope of claim 5.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5-6 and 10-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 5 recites that the "polymer is selected from the group consisting of (a) acrylic and methacrylic acids and salts thereof, (b) esters of acrylic and methacrylic acid,...". The scope of the claim is confusing because it is not clear how a polymer is selected from a group of monomers. Are the polymers obtained from these monomers?

Similar questions arise in claim 6 which recites that the "polymer is selected from the group consisting of" and then recites several different types of monomers.

(b) Claim 5 recites "(d) polyethylene glycols and esters of acrylic and methacrylic acid". The scope of the claim is confusing because it is not clear what compounds are encompassed by

this phrase. Does this refer to copolymers of polyethylene glycol and esters of acrylic and methacrylic acid? Clarification is requested.

Similar questions arise in group (f), which recites the same claim language.

(c) Claim 5 recites "(j) styrene and its derivatives". The scope of the claim is confusing because it is not clear what is meant by "its derivatives". What types of compounds are encompassed by this phrase? Substituted styrene? Copolymers of styrene and other monomers?

(d) Claim 10, lines 9-10, discloses that the reactive monomer or oligomer reacts with the second component to form a polymer, while lines 4-6 of the claim recite that the reactive monomer or oligomer is isocyanate or epoxy-terminated oligomer and the second component is "selected from the group consisting of polyols, polyvinyl alcohols, and base catalysts". The scope of the claim is confusing because it is not clear what type of polymer is formed or how the polymer is formed if the reactive monomer is, for instance, isocyanate, and the second component is a base catalyst. Clarification is requested.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4 and 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kurabayashi et al. (U.S. 5,985,975) taken in view of the evidence found in Mercurio et al. (U.S. 4,023,977).

Kurabayashi et al. disclose a fixative for ink jet printing wherein the fixative either underprints or overcoats the ink and wherein the fixative comprises vehicle and 0.05-20% polymer which has weight average molecular weight of 2,000-10,000 such as polyvinyl pyrrolidone. It is also disclosed that the ink jet printer used to print the above fixative and ink contains separate cartridges for each of the fixative and the ink. There is also disclosed an ink set comprising cyan, yellow, magenta, and black inks as well as the fixative described above (col.3, lines 23-51, col.4, lines 6-41, col.6, lines 16-22, 32-33, and 41-43, col.6, line 59-col.7, line 4, col.7, lines 37-39, col.11, lines 63-64, col.14, lines 5-7, and example 1).

Although there is no explicit disclosure of the glass transition temperature of the polyvinyl pyrrolidone, it is well known that the glass transition temperature of polyvinyl pyrrolidone is 54 ^{0}C. Evidence to support this position is found in Mercurio et al. (col.4, line 10). Additionally, although there is no explicit disclosure of the melting temperature of polyvinyl pyrrolidone, given that Kurabayashi et al. disclose polyvinyl pyrrolidone possessing glass transition temperature, which defines polymer morphology, and molecular weight, which defines the polymer size or chain length, as presently claimed, it is clear that the polyvinyl pyrrolidone would inherently possess melting temperature as presently claimed.

In light of the above, it is clear that Kurabayashi et al. anticipates the present claims.

NOTE: Claim 5 is not being included in the above rejection even though claim 6 depends on claim 5, since claim 6 is improperly broader in scope relative to claim 5 as noted in the claim objection in paragraph 2 above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwazaki et al. (U.S. 5,640,187) in view of Mercurio et al. (U.S. 4,023,977), Satake et al. (U.S. 5,814,685), Takizawa et al. (U.S. 5,623,294), and Thompson et al. (U.S. 6,341,856).

Kashiwazaki et al. disclose a fixative for ink jet printing wherein the fixative underprints the ink and wherein the fixative comprises vehicle and 0.001-20% polymer including (i) basic polymer including homopolymers of vinyl pyrrolidone, vinyl pyridine, and vinyl imidazole or copolymer of either vinyl pyrrolidone, vinyl pyridine, or vinyl imidazole with monomers such as vinyl ester, (meth)acrylates, styrene, and vinyl ether or (ii) acidic polymer including copolymers of (meth)acrylic acid with monomers such as vinyl ester, (meth)acrylates, styrene, and vinyl ether. It is also disclosed that the ink jet printer contains separate cartridges for each of the fixative and the ink (col.2, lines 28-45, col.5, lines 3-26, col.10, lines 32-37, 40-42, 54-55, and 57-62, col.11, lines 7-8 and 28-31, and col.19, lines 19-24).

The difference between Kashiwazaki et al. and the present claimed invention is the requirement in the claims of the glass transition temperature, weight average molecular weight, and melting point of the polymer present in the fixative.

Kashiwazaki et al. clearly disclose the use of polymers as presently claimed, but is silent with respect to the glass transition temperature, weight average molecular weight, and melting point of these polymers.

The glass transition temperatures of the monomers used to obtain the polymers in Kashiwazaki et al. are well known, as found in references such as Mercurio et al. (col.3, line 63-col.4, line 18). The glass transition temperature (Tg) of vinyl acetate (Tg = 30 ^{0}C), propyl methacrylate (Tg = 35 ^{0}C), t-butyl acrylate (Tg =43 ^{0}C), vinyl pyrrolidone (Tg = 54 ^{0}C), etc. disclosed by Kashiwazaki et al. all fall within the glass transition temperature presently claimed. Further, given the relationship between the type and amount of monomer utilized to form a polymer and the glass transition temperature of the polymer as found in col.3, lines 54-64 and col.4, lines 10-19 of Satake et al., it would have been within the skill level of one of ordinary skill in the art to choose the types and amounts of monomers used to form the polymers of Kashiwazaki et al. in order to control the glass transition temperature of the polymer and thus the viscosity and water resistance of the fixative composition.

With respect to the weight average molecular weight, Takizawa et al., which is drawn to ink set comprising fixative and ink, disclose the use of polymer having weight average molecular weight of 1,000-500,000 in the fixative in order to control the viscosity and the jettability of the fixative (col.9, lines 25-32).

With respect to the melting temperature, Thompson et al. disclose that ink jet printers normally operate at temperatures of 50-150 ^{0}C (col.10, lines 38-39). Given that the fixative of Kashiwazaki et al. is printed using an ink jet printer and further given that in order that the ink be properly ejected from the nozzles of the ink printer the fixative must be in liquid form, it would have been obvious to one of ordinary skill in the art to choose polymer which melts at 50-150 ^{0}C in order that the fixative can be properly liquefied and ejected from the ink jet printer without clogging the printer nozzle.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to choose polymer in Kashiwazaki et al. which has glass transition temperature, weight average molecular weight, and melting temperature, including those presently claimed, in order to form a fixative with suitable viscosity and good water resistance and jetability which is ejected from the printer nozzles without clogging the printer, and thereby arrive at the claimed invention.

10. Claims 10 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwazaki et al. (U.S. 5,640,187) in view of Lawrence et al. (U.S. 6,280,027) and Thompson et al. (U.S. 6,341,856).

Kashiwazaki et al. disclose a fixative for ink jet printing wherein the fixative underprints the ink and wherein the fixative comprises vehicle and 0.001-20% polyurethane (col.2, lines 18-27, col.6, lines 25-29, col.7 lines 18-19 and 23-25).

The difference between Kashiwazaki et al. and the present claimed invention is the requirement in the claims of (a) two-part system, (b) glass transition temperature and melting temperature of the polymer, and (c) amount of reactive monomer.

With respect to difference (a), it is noted that the present claims require a fixative comprising a reactive monomer such as isocyanate and second component such as polyol wherein the reactive monomer and second component react to form a polymer on the printing medium while Kashiwazaki et al. disclose jetting a fixative comprising polyurethane onto a printing medium. It is well known that polyurethane is formed by the reaction of isocyanate and polyol.

Noting that the present claims are directed to a fixative, and further that the claimed fixative is the same as the fixative of Kashiwazaki et al. once the isocyanate and polyol are reacted on the printing medium, that is, after reaction the claimed fixative comprises polyurethane, i.e. formed by the reaction of isocyanate and polyol, as does the reference fixative, it is not seen as to how the process of forming the fixative by separately combining the ingredients via a reaction between isocyanate and polyol (two-part system) would lead to the fixative as being patentable over the same fixative formed by directly jetting the polymer into the printing medium (one-part system). Moreover, there is no evidence to indicate any criticality of the two-part system over the one-part system.

With respect to difference (b), Kashiwazaki et al. disclose the use of polyurethane, but do not disclose the glass transition temperature or melting temperature of the polymer. Lawrence et al., which is drawn to ink jet printing process comprising printing ink onto polyurethane layer, disclose the use of polyurethane which has glass transition temperature of –50 to 100 ^{0}C in order to enhance the fixability of the printed image which produces an image which does not smear when subjected to water (col.1, line 66-col.2, line 4 and col.4, lines 63-64).

Further, with respect to the melting temperature, Thompson et al. disclose that ink jet printers normally operate at temperatures of 50-150 ^{0}C (col.10, lines 38-39). Given that the fixative of Kashiwazaki et al. is printed using an ink jet printer and further given that in order that the ink be properly ejected from the nozzles of the ink printer the fixative must be in liquid form, it would have been obvious to one of ordinary skill in the art to use polyurethane which melts at 50-150 ^{0}C in order that the fixative can be properly liquefied and ejected from the ink jet printer without clogging the printer nozzle.

Given that the claimed fixative is the same as the fixative of Kashiwazaki et al. once the isocyanate and polyol are reacted on the printing medium and further given the motivation for using polyurethane having glass transition temperature and melting temperature as described above, it therefore would have been obvious to one of ordinary skill in the art to use the fixative of Kashiwazaki et al. with such polyurethane, and thereby arrive at the claimed invention.

With respect to difference (c), Kashiwazaki et al. disclose the use of polyurethane in the fixative fluid. It is well known that polyurethane is formed by reacting isocyanate and polyol.

Thompson et al., which is drawn to reactive ink composition, disclose reacting 2-40% isocyanate with polyol (col.13, lines 23-24) wherein the amount of isocyanate controls the degree of crosslinking (col.5, lines 45-47), which in turn would control the properties of the final reacted product, i.e. polyurethane, such as viscosity, molecular weight, and solubility.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use this amount of isocyanate when forming the polyurethane of Kashiwazaki et al. in order to produce polyurethane with the desired viscosity, molecular weight, and solubility, and thereby arrive at the claimed invention.

11. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwazaki et al. in view of Lawrence et al. and Thompson et al. as applied to claims 10 and 14-15 above, and further in view of Kurabayashi et al. (U.S. 5,985,975).

The difference between Kashiwazaki et al. in view of Lawrence et al. and Thompson et al. and the present claimed invention is the requirement in the claims of different color inks.

Kashiwazaki et al., disclose underprinting an ink composition with fixative. However, there is no disclosure of using the fixative with a set of different color inks as presently claimed.

Kurabayashi et al. disclose using fixative with a set of inks including yellow, cyan, magenta, and black inks in order to produce a multicolor image with no intercolor bleed (col.3, lines 23-25 and col.4, lines 37-39).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use fixative of Kashiwazaki et al. with set of different color inks in order to prevent bleed between the inks, and thereby arrive at the claimed invention.

12. Claims 10 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwazaki et al. (U.S. 5,640,187) in view of Lawrence et al. (U.S. 6,280,027) and Thompson et al. (U.S. 6,341,856).

Kashiwazaki et al. disclose a fixative for ink jet printing wherein the fixative either underprints or overcoats the ink and wherein the fixative comprises vehicle and 0.001-20% polyurethane (col.2, lines 18-27, col.6, lines 25-29, col.7 lines 18-19 and 23-25).

The difference between Kashiwazaki et al. and the present claimed invention is the requirement in the claims of (a) two-part system and (b) glass transition temperature and melting temperature of the polymer.

With respect to difference (a), it is noted that the present claims require a fixative comprising a reactive monomer such as isocyanate and second component such as polyol wherein the reactive monomer and second component react to form a polymer on the printing medium while Kashiwazaki et al. disclose jetting a fixative comprising polyurethane onto a

printing medium. It is well known that polyurethane is formed by the reaction of isocyanate and polyol.

Thompson et al. disclose reacting 2-40% polyisocyanate with polyol and further disclose storing polyol and polyisocyanate in separate reservoirs, i.e. cartridges, in order to prevent premature reaction between the two components (col.5, lines 61-62 and col.6, lines 18-20). It would have been within the skill level of one of ordinary skill in the art to recognize that such premature reaction would result in formation of undesirably high molecular weight or highly crosslinked polymer before printing wherein such polymer would clog the printer nozzles.

With respect to difference (b), Kashiwazaki et al. disclose the use of polyurethane, but do not disclose the glass transition temperature or melting temperature of the polymer. Lawrence et al., which is drawn to ink jet printing process comprising printing ink onto polyurethane layer, disclose the use of polyurethane which has glass transition temperature of –50 to 100 ^{0}C in order to enhance the fixability of the printed image which produces an image which does not smear when subjected to water (col.1, line 66-col.2, line 4 and col.4, lines 63-64).

Further, with respect to the melting temperature, Thompson et al. disclose that ink jet printers normally operate at temperatures of 50-150 ^{0}C (col.10, lines 38-39). Given that the fixative of Kashiwazaki et al. is printed using an ink jet printer and further given that in order that the ink be properly ejected from the nozzles of the ink printer the fixative must be in liquid form, it would have been obvious to one of ordinary skill in the art to use polyurethane which melts at 50-150 ^{0}C in order that the fixative can be properly liquefied and ejected from the ink jet printer without clogging the printer nozzle.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to form the fixative disclosed in Kashiwazaki et al. by a two-part system wherein polyol and polyisocyanate are kept in separate reservoirs and react on the printing medium to form the polyurethane in order to prevent premature reaction and further it would have been obvious to one of ordinary skill in the art to use polyurethane having glass transition temperature and melting temperature as described above in order to produce fixative which would enhance the fixability of the printed image as well as eject from printer nozzle properly, and thereby arrive at the claimed invention.

13. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwazaki et al. in view of Lawrence et al. and Thompson et al. as applied to claims 10 and 14-15 above, and further in view of Kurabayashi et al. (U.S. 5,985,975).

The difference between Kashiwazaki et al. in view of Lawrence et al. and Thompson et al. and the present claimed invention is the requirement in the claims of different color inks.

Kashiwazaki et al., disclose underprinting an ink composition with fixative. However, there is no disclosure of using the fixative with a set of different color inks as presently claimed.

Kurabayashi et al. disclose using fixative with a set of inks including yellow, cyan, magenta, and black inks in order to produce a multicolor image with no intercolor bleed (col.3, lines 23-25 and col.4, lines 37-39).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use fixative of Kashiwazaki et al. with set of different color inks in order to prevent bleed between the inks, and thereby arrive at the claimed invention.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ono et al. (U.S. 6,238,045) disclose ink set comprising black, yellow, magenta, and cyan inks as well as fixative composition comprising anionic polymer including polyacrylic acid, styrene-(meth)acrylic acid copolymer, and styrene-(meth)acrylic acid-(meth)acrylate, however, there is no disclosure of the glass transition temperature, melting temperature, or molecular weight of the polymer in the fixative.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Callie E. Shosho
Examiner
Art Unit 1714

Callie Shosho

Callie Shosho
February 20, 2002